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Mandatory IFRS adoption and the cost of debt in Italy and UK

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This paper analyses the effect of the mandatory adoption of International Financial Reporting Standards (IFRS) within the EU on the cost of corporate debt. In order to avoid the imprecision involved in a large-scale cross-country study, we examine the impact of IFRS in two very clearly different institutional settings, the UK and Italy. The UK is a common-law country characterised by strong enforcement and national generally accepted accounting principles (GAAP) which are equivalent to IFRS. Italy is a typical European code-law country, characterised by a weak outside investor protection system, and national GAAP significantly different from the IFRS model. No IFRS effect is observed in the UK, consistent with it having standards which are close to IFRS. During the post-IFRS period, in Italy more weight is placed on the accounting numbers to assess the cost of debt. We also find that accruals quality improves in Italy, thus suggesting that public financial reporting data are enhanced relative to privately held information about borrowers' credit ratings.

Keywords: cost of debt; IAS/IFRS; mandatory adoption; standard setting

1. Introduction

Since 1st January 2005, all EU-listed companies are required to produce their financial statements in accordance with the International Financial Reporting Standards (IFRS). Such an accounting harmonisation process was strongly encouraged in order to enhance comparability among annual reports, to reduce levels of information asymmetry and to improve risk estimation (European Community Regulation No. 1606/2002). Regulators and standard setters expected that high quality and transparent financial information deriving from IFRS implementation would increase investors' wealth by boosting market liquidity, creating new opportunities for diversification and, finally, reducing the cost of capital.

The empirical results so far in the academic literature are principally concerned with the implications for equity markets. Generally, the benefits of IFRS mandatory adoption are not universal, but appear to be stronger in countries where firms have greater incentives to be transparent and with legal systems that effectively protect outside investors' claims (Ball *et al.* 2003, Lee *et al.*

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2008, Li 2010, Daske *et al.* 2013). Researchers have also investigated the effect of the EU requirement on analysts' forecasts. Both Horton *et al.* (2013) and Byard *et al.* (2011) report that the impact of IFRS adoption varies with the difference between local generally accepted accounting principles (GAAP) and the mandated IFRS treatment (for a detailed review of the literature, see Brown 2011).

In order to gain a fuller understanding of the economic consequences of the current accounting harmonisation process, we consider the effects of mandatory IFRS adoption on the cost of debt capital. This aspect is important since debt markets are a key source of external financing and accounting information plays a vital role in defining debt contract conditions (Holthausen and Leftwich 1983). Moreover, Ball *et al.* (2008) argue that equity markets are not the primary source of demand for financial reporting. For example, they suggest that the conservatism embedded in accounting measurement is more appropriate to the debt market which is concerned largely with downside risk.

Despite the importance of the impact of mandatory adoption of IFRS on debt markets, only a few articles deal with the issue (Wu and Zhang 2009, Florou and Kosi 2013, Florou *et al.* 2013). Those studies which do address the issue follow the substantive literature from the equity market in conducting large-scale cross-country analyses; they also find that the impact is largely confined to countries with strong legal systems and institutions. This finding is surprising, since outside of such an environment, a mandatory switch to IFRS may provide the opportunity for companies to make disclosures which are more credible than previously, resulting in lenders offering less strict terms in the debt contract.

We take a different approach to these papers in three main respects. First, we focus on just two countries, Italy and the UK, in order to avoid concerns about the indices which are used in the large-scale cross-country studies. Secondly, we modify the equation used to test the impact of mandatory adoption on the cost of finance so that it reflects more directly an objective of the International Accounting Standards Board (IASB), which is to allow the lenders to place greater reliance on the IFRS accounting numbers than those disclosed under the prior local GAAP. Thirdly, we provide some preliminary evidence about the relation between the effects of mandatory IFRS adoption on (i) higher quality financial reporting (a first-order effect) as well as (ii) the cost of debt (a second-order effect) in order to analyse the rationale behind lenders' behaviour.

Our main findings can be summarised as follows. When we perform the conventional test of IFRS impact (the inclusion of an IFRS constant in the cost of debt equation), we find no reduction in the cost of debt in either the UK or Italy. However, when our test measures the reliance placed on the accounting numbers, an impact is identified in Italy. Specifically, more weight is placed on interest cover, which is the most common measure of risk used by debtholders (Christensen *et al.* 2009). This evidence contrasts with many prior studies which find that a strong enforcement regime is necessary before a switch to IFRS has an impact on the cost of finance. We support our finding with some additional evidence which suggests that, after the switch to IFRS, there is a general improvement in the quality of accruals in Italy; accruals are also more informative about future cash flows. This result reinforces the findings from a small number of studies (for example, Gaio and Raposo 2011) which document that companies are able to compensate for a weak legal environment by adopting higher quality accounting standards. The findings are relevant for other similar countries in the EU. No effect is observed in the UK, consistent with it having standards which were similar to IFRS before 2005.

The remainder of the paper proceeds as follows. The next section outlines the background to and the theoretical underpinnings of the relation between IFRS and debt financing. Section 3 describes the research method employed in this paper to test the economic effects of mandatory IFRS adoption on the cost of debt capital. Section 4 discusses the empirical results and Section 5 concludes.

2. Background and hypothesis development

2.1. *Background*

Following the requirement that all EU-listed companies adopt IFRS from 1st January 2005, a number of studies have examined whether this mandatory change to financial reporting rules has been associated with an equity market impact (Daske *et al.* 2008, Christensen *et al.* 2009, Li 2010, Byard *et al.* 2011). Although the studies vary as to the EU (and non-EU) countries included, a feature of several of these investigations is that there is indeed a fall in the cost of equity capital resulting from mandatory IFRS adoption, but one that is confined to countries with a strong enforcement regime.

The objective of the IASB, and also the main goal of the EU when making the adoption of IFRS mandatory, was to improve the financial communication between a company and its stakeholders. In this context, however, Ball *et al.* (2008) argue that equity markets do not constitute the primary demand for financial reporting since there are other more timely sources of corporate news available to shareholders. This means that the rewards to IFRS adoption may be more pronounced in the debt, rather than the equity, market. Studies of the debt market follow much the same approach as their equity market counterparts. The investigations are based on worldwide cross-sectional samples, making an adjustment for the different regime characteristics of each country. For example, Wu and Zhang (2009) and Florou *et al.* (2013) examine credit ratings; Bharath *et al.* (2008) examine the impact of different measures of accounting earnings quality on the non-price aspects of debt contracting including the public vs. private decision, loan maturity and required collateral. There is just one study, Florou and Kosi (2013), concerned with whether the mandatory adoption of IFRS reduces the cost of debt. They follow other studies in using a worldwide cross section of firms and find that any reduction in the cost of debt is conditional on a strong enforcement regime. Surprisingly, the size of the difference between prior local GAAP and IFRS plays an inconsistent part in the reduction of debt cost (for a review of the literature, see Pope and McLeay 2011, p. 259).

2.2. *Hypothesis development*

General purpose financial statements may be used as a tool to alleviate the asymmetric information problem associated with the debt-contracting process (Holthausen and Leftwich 1983). Specifically, in lending to a company, the lender takes a risk since it has inadequate information about the company. Consequently, the information which is available is weighted according to its quality and reliability. This situation arises because information is costly to acquire and/or the disclosures of the company may lack credibility. The lender compensates for this risk by choosing an interest rate (or another aspect of the debt contract) which reflects the information risk as well as the economic risk associated with the borrower. In addition, following the acceptance of the debt contract, the lender is able to maintain these terms since it is now at an information advantage with respect to other lenders (Fama 1985, Rajan 1992). Credible disclosure by the company can reduce the information risk; for example, Schenone (2010) finds that interest costs tend to fall as a result of the additional disclosures required for an initial public offering. Other support for an inverse relation between the cost of debt and disclosure quality is given by Sengupta (1998), Mazumdar *et al.* (2000), Miller and Puthenpurackal (2002) and Bharath *et al.* (2008).

The IFRS financial reporting model is characterised by a higher quality of earnings, and a more extensive and informative disclosure approach relative to domestic accounting standards (Daske and Gunther 2006, Hail *et al.* 2009, Armstrong *et al.* 2010). Therefore, as a result of the mandatory switch to IFRS, it is possible that new credible and relevant information was made available so that greater weight could be given to it in the determination of the interest

cost component of the debt contract. The resulting interest rate would then be higher or lower than before depending on the difference between the credible disclosure under IFRS and the previous (riskier) estimate by the lender.

Despite these potential advantages to debt issuers from adopting IFRS, there are other viewpoints which suggest that the case for IFRS is not so clear cut. First, the main objective of the IASB accounting model is 'decision-usefulness' leading to a greater use of mark-to-market measurements (Zeff 2013). However, this approach may be less suitable for 'stewardship' purposes and for the information needs of debt holders (Gjesdal 1981, Lennard 2007, Gassen 2008, Whittington 2008, Shivakumar 2013). Indeed, a conservative approach to financial information has often been considered as an efficient contracting mechanism that may address agency problems arising from debt financing (Watts 2003, Watts 2006, Beatty *et al.* 2007). Analytical and empirical articles support this hypothesis and highlight the benefits of accounting conservatism for both lenders (through a timely signalling of default risk) and borrowers (through a lower initial interest rate) (Zhang 2008, Gox and Wagenhofer 2009). Secondly, the principles-based nature of the IFRS model might allow managers/controlling shareholders to undertake opportunistic behaviour to the detriment of minorities/creditors, thereby reducing the credibility of financial reporting regardless of the quality of the accounting standards applied (Ball 2006, Burgstahler *et al.* 2006, Daske *et al.* 2008, Jeanjean and Stolowy 2008, Capkun *et al*. 2013). Finally, discretion in implementing IFRS may allow companies to make only notional changes to their accounting and disclosure policies (Nobes 2006, Kvaal and Nobes 2010, Leuz 2010, Kvaal and Nobes 2012, Nobes 2013). In particular, these 'label' adopters are more likely to operate in countries where economic and political conditions provide weaker incentives for transparency (Daske *et al.* 2013). Consequently, where the improvements to reporting from the switch to IFRS are largely thwarted by companies, or are not viewed as credible by lenders, then the effect of a switch to IFRS on the debt contract may be minimal.

An analysis of the theories briefly outlined in this section suggests that an assessment of the impact of mandatory IFRS adoption on the cost of debt capital is an empirical matter. For this reason, the hypothesis (in the alternate form) examined in this paper is:

H_1: The mandatory adoption of IFRS has no effect on the cost of debt.

3. Research method and sample construction

3.1. *Focussing on two countries, the UK and Italy*

A majority of the prior work in this area uses a world- (or EU-)wide cross-sectional sample and then adjusts for the differences between countries with respect to their institutional characteristics such as the enforcement of the rule of law, and the divergence between local GAAP and the mandated IFRS. Typically, the indices used are taken from such sources as La Porta *et al.* (1998), Ding *et al.* (2007), Kaufmann *et al.* (2007) and Bae *et al.* (2008).

However, the use of these indices to capture country differences is not without its problems (Collison *et al*. 2012). Enforcement of the rule of law indices suffer from two related drawbacks. If the indices are based on perceptions, then perceptions may be framed by local conditions and respondents in one country may score the same governance characteristics differently compared with respondents in another. Also, there may be differences in perception within a country. For these reasons, Kurtz and Schrank (2007) argue that the perceptions-based, cross-country measures of governance in Kaufmann *et al.* (2007) are fatally flawed.

Alternatively, if they are based on an aggregation of legal rules, as in La Porta *et al.* (1998), then they do not incorporate information on how the rules are implemented. There may be

implementation differences within a country so that firm and industry characteristics explain much more of the variation in earnings quality rankings than country characteristics as reported in a worldwide study by Gaio (2010).

It is not surprising therefore that there is a remarkably low correlation between different enforcement proxies (Preiato *et al.* 2013, Table 5). Another area of concern is that enforcement variables are not specific enough. Preiato *et al.* (2013) argue that the indices covering the legal and institutional setting of a country do not adequately capture auditing and accounting enforcement. They find that only when accounting-focussed enforcement indices are used does IFRS reporting improve analysts' forecast errors.

The indices used, in both equity and debt market studies, to capture differences between local GAAP and IFRS are typically based on Ding *et al.* (2007) and Bae *et al.* (2008). They are an aggregation of differences in a large number of areas (see, for example, Bae *et al*. 2008, p. 601). The main weakness of these indices is that the differences are unsigned and dichotomous; they do not capture whether local GAAP is better or worse than IFRS and the extent of any deviation. It is not surprising therefore that few studies, including Florou and Kosi (2013), which focus on the debt market, do not find a clear impact of local-IFRS GAAP differences on the cost of capital. An exception to this generalisation is the study of analysts' forecast errors by Horton *et al.* (2013). However, interestingly, they use their own index based on the reported reconciliation between IFRS and local GAAP earnings, which is both a signed and a continuous variable.

Given the above problems with using indices to capture differences between countries, in this study we compare the cost of debt capital of UK- and Italian-listed companies in the pre-IFRS period with the cost in the post-IFRS period. Indeed, current differences in the institutional contexts of Italy and the UK offer a unique opportunity to test the real efficacy of international accounting standards on debt financing activities (Joos and Lang 1994, Nobes 1998, Ali and Hwang 2000).

Italy is a typical European code-law country. It is characterised by a small equity market (it is nearly a quarter of the UK one – see Nobes and Alexander 2010, p. 72), an inadequate system for protecting the rights of outside investors and a domestic GAAP which is significantly different from the IFRS model (Zambon 2001). Indeed, with respect to the IAS/IFRS, Italy is classified as a 'large GAAP differences' country, being characterised by opaque earnings and low disclosure quality (Marra *et al*. 2011). Consistently, empirical evidence shows that the transition to IAS/IFRS has had a sizeable impact on Italian accounting practices (Cordazzo 2013). In contrast, the UK is a common-law country characterised by a strong outsider legal protection regime and a domestic GAAP considered to be equivalent in disclosure quality to IFRS (Lee *et al.* 2008). The differences in the quality of disclosure between the two countries are documented in Bhattacharya *et al.* (2003, Table 3) which shows that Italy is in the fourth quintile of countries having the most opaque earnings, whereas the UK is in the second quintile. As a result, Kvaal and Nobes (2012, Table 4) show that the impact of IFRS was far greater in Continental Europe than in the UK, although differences still existed (Nobes 2011, Table 4).

These differences between UK and Italian reporting may lead to a differential impact of the mandatory switch to IFRS. It is unlikely that UK companies would have been required (or even would have needed) to make improved public disclosures so as to increase the efficiency of estimating their credit ratings. In contrast, the differences between Italian GAAP and IFRS point to the scope for an impact.

3.2. *The sample*

Using firm-year panel data from 2002 to 2008, this paper examines the impact of IFRS adoption on the cost of debt of 88 UK- and 74 Italian-listed companies. The sample has been drawn from

the population of non-financial companies on the Worldscope database. The selected firms are non-voluntary IFRS adopters and non-cross-listed companies whose shares have been quoted at the London and Milan Stock Exchanges for at least 10 consecutive years. The Italian sample includes all the available companies in Worldscope database meeting the adopted research criteria; 81% of the Italian firms in the sample were 'small-cap' companies and the remaining 19% were listed at the FTSE MIB (the index for the 40 most traded stock classes on the exchange). Therefore, in order to maximise the number of observations and preserve, at the same time, the comparability between the Italian and the UK samples, the UK sample was built by adding 17 randomly selected FTSE 100 firms to all the small-cap companies (71) resulting from the search process.

Finally, to control for outliers, we delete all non-dichotomous variables at the tails of 5% and 95%. Consequently, the normality of the variables' distribution improved (Table 1), but the number of UK (Italian) firm-year observations reduced from 616 (518) to 544 (462).

3.3. *Modelling the impact of mandatory IFRS*

Prior studies, almost without exception, model the impact of IFRS adoption by including a dummy variable as a constant in the cost of capital equation. The expected sign of the coefficient on this variable is negative, indicating that the adoption of IFRS should reduce the cost of capital by the same percentage for all companies. In the case of voluntary adoption, this assumption is reasonable since the change from local GAAP to IFRS is interpreted by market participants as a costly and thus credible signal delivered by 'good borrowers' in order to distinguish themselves from their riskier competitors (Landsman 2007, Kim *et al.* 2011). This reduces borrowing costs as the enhanced disclosure via IFRS decreases the information asymmetries between borrowers and lenders and improves coordination between firms and suppliers of debt capital (Sengupta 1998, Mazumdar *et al.* 2000, Miller and Puthenpurackal 2002, Lambert *et al.* 2007, Bharath *et al.* 2008).

In the case of mandatory adoption, the approach of prior work is much the same except that sometimes there are several IFRS constants to distinguish between first-time mandatory adopters and those adopting voluntarily prior to the mandatory date (Florou and Kosi 2013, p. 12). This approach is fairly crude and does not reflect adequately the consequences of mandatory adoption. The essence of mandatory IFRS adoption is that lenders can put more reliance on the financial statements, and the cost of debt may fall. However, it may also rise if the newly revealed financial position of a company is less favourable than before. This means that for some companies the IFRS constant may be negative (a reduction in cost), but for others it may well be positive (a rise in cost). When these two situations are combined, there is a bias towards finding that the IFRS constant is close to zero. This outcome is especially likely in countries with relatively poor local GAAP and weak enforcement; in this environment, there is more likely to be a mix of companies, some with good quality reporting practices which are confirmed by the financial statements produced under IFRS; others may now be seen to have employed poor quality reporting practices which were not apparent under the past disclosure regime. Consequently, it is not surprising that studies have generally failed to find an IFRS effect in countries with poor enforcement and weak GAAP.

In the light of these issues, a more appropriate specification to model any mandatory IFRS impact is to allow varying weights on the accounting variables in the cost of capital equation. This reflects more directly an objective of the IASB, which is to allow the lenders to place greater reliance on the IFRS accounting numbers than those disclosed under the prior local GAAP, substituting IFRS accounting data for costly private information. As a result, the accounting variables are likely to play a greater role in determining the cost of debt and therefore have larger coefficients. The specification assumes that the change in weight given to an accounting

Table 1. Descriptive statistics of the UK and the Italian samples.

	Panel a: Descriptive statistics – UK sample							Panel b: Descriptive statistics – Italian sample						
	Mean	St. D.	Median	Min.	Max.	Skew.	Kurt.	Mean	St. D.	Median	Min.	Max.	Skew.	Kurt.
Dependent variable														
CostOfDebt	0.071	0.023	0.067	0.034	0.149	0.928	0.939	0.050	0.016	0.047	0.024	0.107	0.875	0.665
Independent variables														
Log_Sales	5.933	1.824	5.969	2.604	9.141	−0.105	−0.818	6.142	1.502	6.005	3.203	8.757	−0.068	−0.804
Tangibility	0.282	0.248	0.207	0.013	0.849	0.992	−0.076	0.260	0.175	0.224	0.023	0.592	0.497	−0.952
CurrRatio	1.369	0.737	1.182	0.535	3.606	0.414	−0.078	1.472	0.795	1.277	0.523	4.066	0.169	−0.144
IntCov	5.917	5.184	4.751	−1.890	24.387	1.155	1.435	3.489	6.732	2.510	−11.140	26.191	0.560	1.321
Log_NIBE	2.792	1.721	2.624	−0.162	6.307	0.217	−0.682	2.746	1.390	2.667	0.382	5.226	0.130	−0.891
InterBR	0.033	0.014	0.031	0.013	0.062	0.026	−1.464	0.032	0.009	0.031	0.021	0.057	0.663	−0.850

Panel c: Independent samples *T*-test for equality of means

	St. error mean	Mean diff.	St. error diff.	*P*
CostOfDebt				
UK	0.001			
		0.021	0.001	.000
Italy	0.000			
CurrRatio				
UK	0.031			
		−0.103	0.048	.033
Italy	0.037			
IntCov				
UK	0.222			
		2.428	0.376	.000
Italy	0.313			

Notes: Panels a and b present the descriptive statistics of the UK and Italian samples. Panel c presents the results of a *T*-test for independent samples. CostOfDebt is given by firm *j*'s interest expense in year *t* to the average interest-bearing debt outstanding during years *t* and *t*−1. Log_Sales is the log of firm *j*'s total sales. Tangibility is the percentage of property, plant and equipment in company *j*'s total assets. CurrRatio is the firm *j*'s current assets divided by current liabilities. IntCov is firm *j*'s ratio of operating income to interest expenses. Log_NIBE is the log of the standard deviation of the firm *j*'s income before extraordinary items. InterbankRate is the yearly average six-month interbank interest rate. For the UK sample: Std. error of skewness equals 0.105 and St. error of kurtosis equals 0.209. For the Italian sample: St. error of skewness equals 0.114 and St. error of kurtosis equals 0.227.

number is the same across all companies, but such an assumption is reasonably realistic if all companies are switching from local to IFRS GAAP. We include this interactive approach to examine the effect of mandatory IFRS adoption.

For comparability with previous work, we first use the single dummy variable approach, as shown in the regression model in Equation (1), where the cost of debt is determined by whether the IFRS regime is in place, firm-specific and macroeconomic control variables, and a residual error term (Kim *et al.* 2011, Florou and Kosi 2013):

$$\text{CostOfDebt}_{j,t} = \alpha + \beta \cdot \text{IFRS}_t + \sum_{i=1}^{n} \gamma_i \cdot \text{Control\_Variable}_{j,t} + \text{Error\_Term}_{j,t}. \quad (1)$$

The dependent variable (CostOfDebt) is represented by the realised cost of debt, given by firm j's interest expense in year t to the average interest-bearing debt outstanding during years t and $t-1$ (t = years from 2002 to 2008). This measurement is used in Sengupta (1998), Francis *et al.* (2005), Liu and Wysocki (2007) and Sánchez-Ballesta and García-Meca (2011).

The explanatory variables are as follows. IFRS is a dummy variable indicating whether an issuer is using IFRS (IFRS = 1) or domestic GAAP (IFRS = 0). In addition, issuer-specific and macroeconomic variables, commonly used in studies, are also included in order to control for other factors that could affect the cost of debt. The control variables divide into five groups: economy-wide influences; company-specific risk; the sensitivity of debt payments to company-specific risk; the security of debt holders in the face of default and industry dummy variables. The variables used are similar to previous work on the cost of debt, such as Francis *et al.* (2005) and Liu and Wysocki (2007). The groups are defined as follows:

Economy-wide influences. The yearly average six-month interbank rate, InterBR (*Euribor* for Italian and *Libor* for UK companies), is included to capture the economy-wide influences on a firm's borrowing costs. This variable is commonly used to eliminate macroeconomic effects (see, for example, Moir and Sudarsanam 2007, Florou and Kosi 2013) and is expected to have a positive association with the CostOfDebt.

Company-specific risk. The log of the standard deviation of net income before extraordinary items over the rolling prior five-year period (Log_NIBE) is introduced to capture the impact of income volatility on the price terms of debt contracts as in Francis *et al.* (2005) and Liu and Wysocki (2007).[1] This variable is expected to have a positive association with the CostOfDebt.

The sensitivity of debt payments to company-specific risk. We use firm size (Log_Sales, defined as the log of total sales) and interest cover (IntCov, defined as the ratio of operating income to interest expense) to control for the sensitivity of the interest payments to variations in firm performance. We include interest cover, since it is the most common ratio used in bank covenants (Demerjian 2007, Christensen *et al.* 2009, Taylor 2013). Interest cover is also used by Francis *et al.* (2005).[2] We also include Log_Sales since IntCov is a ratio, and it may be that the scale of operations is also important. Moir and Sudarsanam (2007) find that Log_Sales affects the cost of debt. Both Log_Sales and IntCov are expected to vary inversely with the CostOfDebt.

Security in the face of default. The percentage of property, plant and equipment to total assets (Tangibility) and the ratio of current assets over current liabilities (CurrRatio) are proxies for the security provided if a firm defaults on a loan. This variable is expected to have a negative association with CostOfDebt.

Industry dummy variables. Finally, dummy variables (Industry_i, $i = 1, \ldots, k$) are introduced to control for industry fixed effects.

When all these control variables are used, the estimating equation is given by the following equation:

$$\begin{aligned}\text{CostOfDebt}_{j,t} = {} & \alpha + \beta \cdot \text{IFRS}_t + \gamma_1 \cdot \text{Log\_Sales}_{j,t} + \gamma_2 \cdot \text{Tangibility}_{j,t} \\ & + \gamma_3 \cdot \text{CurrRatio}_{j,t} + \gamma_4 \cdot \text{IntCov}_{j,t} + \gamma_5 \cdot \text{Log\_NIBE}_{j,t} + \gamma_6 \cdot \text{InterBR}_t \\ & + \sum_{i=1}^{k} \delta \cdot \text{Industry} + \text{Error\_Term}_{j,t}.\end{aligned} \tag{2}$$

In addition to Equation (2), we propose a superior specification in which the mandatory adoption of IFRS changes the coefficients on the accounting variables in the *post*-IFRS period in addition to shifting the constant term. This is achieved by estimating the following interactive equation:

$$\begin{aligned}\text{CostOfDebt}_{j,t} = {} & \alpha + \beta \cdot \text{IFRS}_t + \gamma_1 \cdot \text{Log\_Sales}_{j,t} + \gamma_2 \cdot \text{Tangibility}_{j,t} \\ & + \gamma_3 \cdot \text{CurrRatio}_{j,t} + \gamma_4 \cdot \text{IntCov}_{j,t} + \gamma_5 \cdot \text{Log\_NIBE}_{j,t} + \gamma_6 \cdot \text{InterBR}_t \\ & + \theta_1 \cdot \text{IFRS} \cdot \text{Log\_Sales}_{j,t} + \theta_2 \cdot \text{IFRS} \cdot \text{Tangibility}_{j,t} + \theta_3 \cdot \text{IFRS} \cdot \text{CurrRatio}_{j,t} \\ & + \theta_4 \cdot \text{IFRS} \cdot \text{IntCov}_{j,t} + \sum_{i=1}^{k} \delta \cdot \text{Industry} + \text{Error\_Term}_{j,t}.\end{aligned} \tag{3}$$

Equation (3) is the same as Equation (2) except that the coefficients on the accounting variables are allowed to shift between pre-IFRS and post-IFRS periods.[3] In the *pre*-IFRS period, IFRS = 0 and therefore Equation (3) is the same as Equation (2); in the *post*-IFRS period, IFRS = 1, which means that θ_m ($m = 1, 2, 3, 4$) are the shifts in the coefficients of the accounting variables in the post-IFRS period over and above those in the pre-IFRS period.

4. Results

4.1. *Descriptive statistics*

Panels a and b of Table 1 summarise the descriptive statistics of the UK and the Italian sample, respectively. The mean value of the cost of debt capital borne by UK (Italian) companies is 0.07 (0.05). Focussing on the accounting variables likely to influence the interest rate, our analysis of Table 1 reveals that the mean value of Log_Sales is 5.93 (6.14) while Tangibility is, on average, 0.28 (0.26). UK (Italian) firms in the sample typically have, on average, a CurrRatio of 1.37 (1.47) and an operating income of 5.91 (3.48) times the interest expense (IntCov). In addition, UK firms are slightly larger than their Italian counterparts with a Log_NIBE of 2.79 compared with 2.74. Finally, the mean value of the InterBR is 3.3% for the UK sample and 3.2% for the Italian firms. These values seem plausible and suggest that the UK and Italian samples are comparable. Table 1 also shows that the skewness and kurtosis measures of all the examined variables are lower than the absolute value of 2. Therefore, the degree of asymmetry of variable distributions is not a serious concern (Garson 2012, Lomax and Hahs-Vaughn 2012).[4]

Panel c of Table 1 compares the descriptive statistics, testing for the equality of means. This procedure highlights how the CostOfDebt for UK companies is significantly higher than in Italy.[5] This higher cost of debt in the UK exists despite the fact that the average value of IntCov is higher for UK companies. On the other hand, the UK companies report a current ratio which is slightly lower than in the Italian sample.

Table 2 shows Pearson and Spearman correlations between variables of the UK and Italian samples. All the correlation values are below the critical limits of 0.80, and therefore multicollinearity in the independent variables is not a serious problem in the regression analysis (Hair *et al.* 1995).[6]

4.2. *Regression analysis*

In order to assess the impact of mandatory IFRS adoption on the cost of debt of UK- and Italian-listed companies, we first estimate Equation (2) over the period 2002–2008, covering both the pre-IFRS and post-IFRS periods, for the UK sample and then for the Italian sample. In this equation, the IFRS effect is captured by a fixed shift in the constant for all companies. Since the samples may be clustered due to multiple observations for the same company, a clustered-robust standard error is computed for both the UK and Italian observations in order to mitigate any heteroskedasticity and autocorrelation problems which may be present. The results are given in Panels a and b of Table 3.

The overall R^2 for the UK (Italian) sample is 29.8% (28.1%)[7]; in neither case is the IFRS variable significant. This means that the mandatory IFRS adoption does not appear to have caused a fixed decrease in the cost of debt for all companies. However, some of the accounting variables are significantly associated with CostOfDebt. In the UK, all of the company-specific aspects have a variable which is significant and has the correct sign: security in the face of default (represented by Tangibility); sensitivity of debt payments to risk (represented by IntCov) and company risk (Log_NIBE). The Italian results provide a quite different picture. As might be expected in an economy with relatively poor disclosure, there is a somewhat crude approach to risk, with Tangibility (representing security in the face of default) being the only company-specific variable to be significantly correlated with CostOfDebt. In addition, the general level of interest rates (InterBR) is significant for both the UK and Italian samples.

As explained above, the weakness of Equation (2) (the fixed shift approach) is that in the case of mandatory adoption the coefficients of the accounting variables may change between the pre-IFRS and post-IFRS periods. This may arise because accounting numbers now better capture the economic factors which affect the cost of debt in the post-IFRS period, thereby increasing the importance of financial reporting data relative to the privately held information (a substitution effect). In order to investigate this possibility, for both the UK and Italian samples, we estimate Equation (3), the interactive model. The results are given in Table 4, Panel a (for the UK) and Panel b (for Italy).[8]

In the UK, the results for the interactive model in Equation (4) are very similar to those for the shift model of Equation (2) in Table 3 (Panel a). The R^2 values are similar, 29.8% in Table 3 and 30.3% in Table 4. The same variables are significant (with the correct sign) in both tables. However, the shift coefficients, IFRS.Log_Sales, IFRS.Tang, IFRS.IntCov and IFRS.CurrRatio are not significant, indicating that there is no significant change in the coefficients between the pre-IFRS and post-IFRS periods. Overall therefore, from the evidence in Tables 3 and 4, we cannot detect an impact of IFRS adoption on the cost of debt. This result is not surprising given the closeness of UK GAAP to IFRS. Furthermore, given the maturity of the UK debt market, it is logical that accounting variables in both pre-IFRS and post-IFRS periods contribute to the three firm-specific aspects of debt cost: company risk; the sensitivity of debt to risk and security in the face of default.

Table 2. Correlation matrices.

	1	2	3	4	5	6	7	8
UK sample								
1. CostOfDebt	1.000	0.060*	−0.012	0.096**	−0.126***	0.107***	0.138***	0.131***
2. Log_Sales	0.021	1.000	−0.088**	−0.044	0.226***	0.750***	0.052	0.070*
3. Tangibility	−0.061*	−0.146***	1.000	0.029	−0.153***	0.005	−0.059*	−0.069*
4. CurrRatio	0.152***	−0.050	0.027	1.000	0.034	−0.044	−0.006	−0.035
5. IntCov	−0.094**	0.207***	−0.173***	0.026	1.000	0.015	0.152***	0.127***
6. Log_NIBE	0.083**	0.750***	0.012	0.031	0.027	1.000	0.076**	0.079**
7. InterbankRate	0.133***	0.054	−0.040	−0.042	0.097**	0.072**	1.000	0.670***
8. IFRS	0.116***	0.075**	−0.049	−0.052	0.080**	0.080**	0.675***	1.000
Italian sample								
1. CostOfDebt	1.000	0.101**	−0.235***	−0.072*	−0.235***	0.077**	0.346***	0.174***
2. Log_Sales	0.051	1.000	0.138***	−0.224***	0.177***	0.597***	0.063*	0.062*
3. Tangibility	−0.249***	0.101**	1.000	−0.282***	0.106**	0.026	−0.036	−0.002
4. CurrRatio	−0.065*	−0.283***	−0.276***	1.000	0.179***	−0421***	−0.098**	−0.122***
5. IntCov	−0.149***	0.138***	0.051	0.157***	1.000	−0.127***	−0.044	−0.046
6. Log_NIBE	0.052	0.591***	0.042	−0.338***	−0.155***	1.000	−0.018	0.069*
7. InterbankRate	0.306***	0.064*	−0.028	−0.141***	−0.023	0.024	1.000	0.451***
8. IFRS	0.149***	0.055	0.000	−0.124***	−0.061*	0.065*	0.533***	1.000

Notes: CostOfDebt is given by firm *j*'s interest expense in year *t* to the average interest-bearing debt outstanding during years *t* and *t* − 1. Log_Sales is the log of firm *j*'s total sales. Tangibility is the percentage of property, plant and equipment in company *j*'s total assets. CurrRatio is the firm *j*'s current assets divided by current liabilities. IntCov is firm *j*'s ratio of operating income to interest expenses. Log_NIBE is the log of the standard deviation of the firm *j*'s income before extraordinary items. InterbankRate is the yearly average six-month interbank interest rate. Industry is a dummy variable introduced to capture industry fixed effects. IFRS is a dummy variable indicating whether firm *j* is using IFRS or not. Pearson (Spearman) correlations are reported below (above) the diagonal.

*Significance at the 10% level using a one-tailed test.

**Significance at the 5% level using a one-tailed test.

***Significance at the 1% level using a one-tailed test.

Table 3. Multivariate analysis (fixed shift approach).

Dependent variable: CostOfDebt		Panel a: Multivariate analysis – UK sample		Panel b: Multivariate analysis – Italian sample	
Independent variables	Predicted sign	Coefficients	*t*-Statistic	Coefficients	*t*-Statistic
IFRS	?	−.00039	−0.13	−.00092	−0.58
Log_Sales	(−)	−.00158	−0.98	.00141	1.31
Tangibility	(−)	−.02308	−2.12**	−.02291	−3.76***
CurrRatio	(−)	.00114	0.63	−.00025	−0.15
IntCov	(−)	−.00075	−3.13***	−.00019	−1.16
Log_NIBE	(+)	.00260	1.85*	.00033	0.31
InterBR	(+)	.22664	2.18**	.51602	6.37***
Industry dummies		Included	–	Included	–
N. observations		544		462	
N. clusters		88		74	
R^2		0.298		0.281	
Skewness of residuals		0.925		0.989	
Kurtosis of residuals		1.030		1.364	

Notes: This table details the clustered-robust regression results of Equation (2) (fixed shift approach). CostOfDebt is given by firm *j*'s interest expense in year *t* to the average interest-bearing debt outstanding during years *t* and *t*−1. IFRS is a dummy variable indicating whether firm *j* is using IFRS or not. Log_Sales is the log of firm *j*'s total sales. Tangibility is the percentage of property, plant and equipment in company *j*'s total assets. CurrRatio is the firm *j*'s current assets divided by current liabilities. IntCov is firm *j*'s ratio of operating income to interest expenses. Log_NIBE is the log of the standard deviation of the firm *j*'s income before extraordinary items. InterbankRate is the yearly average six-month interbank interest rate. Industry is a dummy variable introduced to capture industry fixed effects.
*Significance at the 10% level.
**Significance at the 5% level.
***Significance at the 1% level.

In Italy, the results are similar to the UK in that the variables that are significant in Equation (3) (Table 4, Panel b), Tangibility and InterBR, have similar values to those that are significant in Equation (2) (Table 3, Panel b). However, in contrast to the UK, the coefficient on IFRS.IntCov is also significant, indicating that there is an increase in the weight given to interest cover in the post-IFRS period. In the pre-IFRS period, it plays no part in determining the cost of debt; but it becomes important in the post-IFRS period presumably due to the greater confidence with which operating earnings are measured. This result is intuitively plausible: (i) as previously mentioned, interest cover is the most common ratio used in bank covenants to measure the exposure of interest payments to company-specific risk; (ii) IntCov is significant in the UK in the prior IFRS period, thus indicating debt interest determination in an economy with a domestic GAAP close to IFRS; (iii) the other variable intended to capture this risk aspect of the cost of debt, Log_Sales, is not significant in any of our tests (in the UK or in Italy). The weight given to the variables capturing security in the face of default, CurrRatio and Tangibility, are not affected by the switch to IFRS. This result is understandable. CurrRatio is a relatively weak proxy for security, as working capital is typically insufficient to repay debt. Also Tangibility is unlikely to be improved by IFRS as there was limited adoption of fair value in Italy (Nobes 2011).

4.3. *Robustness and additional analysis*

In order to test the robustness of this IFRS impact of the IntCov variable in Italy, we estimate Equation (2) separately, for Italy, over the pre-IFRS and post-IFRS periods. First, we find that the R^2 for pre-IFRS period is 19.4% compared with 38.8% in the post-IFRS period. Second, the

Table 4. Multivariate analysis (interactive model).

Dependent variable: CostOfDebt		Panel a: Multivariate analysis – UK sample		Panel b: Multivariate analysis – Italian sample	
Independent variables	Predicted sign	Coefficients	*t*-Statistic	Coefficients	*t*-Statistic
IFRS	?	.00435	0.51	−.00471	−0.43
Log_Sales	(−)	−.00120	−0.72	.00020	0.13
Tangibility	(−)	−.02210	−1.92*	−.02036	−2.22**
CurrRatio	(−)	.00213	1.02	.00043	0.17
IntCov	(−)	−.00105	−3.37***	.00015	0.66
Log_NIBE	(+)	.00262	1.88*	.00090	0.65
InterBR	(+)	.21914	2.09**	.49900	5.72***
IFRS.Log_Sales	(−)	−.00072	−0.63	.00222	1.43
IFRS.Tangibility	(−)	−.00352	−0.47	−.00553	−0.59
IFRS.CurrRatio	(−)	−.00192	−0.71	−.00212	−0.91
IFRS.IntCov	(−)	.00057	1.25	−.00069	−3.44***
Industry dummies		Included	–	Included	–
N. observations		544		462	
N. clusters		88		74	
R^2		0.303		0.306	
Skewness of residuals		0.942		0.923	
Kurtosis of residuals		1.129		0.963	

Notes: This table details the clustered-robust regression results of Equation (3) (interactive model). CostOfDebt is given by firm *j*'s interest expense in year *t* to the average interest-bearing debt outstanding during years *t* and *t* − 1. IFRS is a dummy variable indicating whether firm *j* is using IFRS or not. Log_Sales is the log of firm *j*'s total sales. Tangibility is the percentage of property, plant and equipment in company *j*'s total assets. CurrRatio is the firm *j*'s current assets divided by current liabilities. IntCov is firm *j*'s ratio of operating income to interest expenses. Log_NIBE is the log of the standard deviation of the firm *j*'s income before extraordinary items. InterbankRate is the yearly average six-month interbank interest rate. Industry is a dummy variable introduced to capture industry fixed effects.
*Significance at the 10% level.
**Significance at the 5% level.
***Significance at the 1% level.

IntCov variable is significant at the 5% level in the post-IFRS period but not in the pre-IFRS period. Third, the Chow *F*-test, significant at 1%, confirms that a structural break exists between the pre-IFRS and the post-IFRS. The results are not reported here but are available from the authors.

Our results so far indicate (as in the vast majority of other papers) only a second-order effect of the harmonisation process (Brüggemann *et al.* 2013). The increased weight given to the interest coverage ratio in Italy in the post-IFRS period does not distinguish between a real improvement in accounting numbers and a halo effect of IFRS. In order to strengthen our findings, we compare the earnings quality of the pre-IFRS financial statements with that of the post-IFRS period for both the Italian and UK samples.

In order to measure earnings quality, we use the Dechow and Dichev (2002) model (DD model) which considers current accruals as a function of past, present and future cash flows from operations, interpreting the standard deviation of accruals estimation errors as an inverse measure of accrual quality. We estimate Equation (4) for the pre-IFRS and post-IFRS subsamples and assess the changes in the earnings quality of the Italian and UK companies:

$$\mathrm{WCACC}_{j,t} = \alpha + \beta_1 \cdot \mathrm{CFO}_{j,t-1} + \beta_2 \cdot \mathrm{CFO}_{j,t} + \beta_3 \cdot \mathrm{CFO}_{j,t+1} + \mathrm{Error\_Term}_{j,t}, \qquad (4)$$

where $\mathrm{WCACC}_{j,t}$ is the firm *j*'s working capital accruals in year *t* and is defined as EBIT + long-term accruals − cash flow from operations; and $\mathrm{CFO}_{j,t}$ is firm *j*'s cash flow from operations in year

Table 5. Accruals quality (Equation (4)).

(a) Italian sample

Dependent variable: WCACC		Panel a.1: Pre-IFRS period		Panel a.2: Post-IFRS period	
Independent variables	Predicted sign	Coefficients	*t*-Statistic	Coefficients	*t*-Statistic
CFO_{t-1}	(+)	.66136	7.02***	.17891	3.23***
CFO_t	(−)	−.69874	−8.10***	−.47652	−5.64***
CFO_{t+1}	(+)	.06270	1.13	.38620	4.95***

Paired samples *F*-test for equality of variance

		Mean	Standard error	Standard deviation
	Pre-IFRS subsample	1.87e−18	.00762	.05804
	Post-IFRS subsample	−1.39e−18	.00442	.04768
Ratio = sd(Pre-IFRS)/ sd(Post-IFRS)	$f = 1.4815^{**}$ $\Pr(F > f) = 0.0384$			

(b) UK sample

Dependent variable: WCACC		Panel b.1: Pre-IFRS period		Panel b.2: Post-IFRS period	
Independent variables	Predicted sign	Coefficients	*t*-Statistic	Coefficients	*t*-Statistic
CFO_{t-1}	(+)	.04649	0.34	.20055	3.03***
CFO_t	(−)	−.29641	−3.74***	−.84972	−11.61***
CFO_{t+1}	(+)	.38824	4.35***	.31359	3.72***

Paired samples *F*-test for equality of variance

		Mean	Standard error	Standard deviation
	Pre-IFRS subsample	1.87e−17	.00670	.06034
	Post-IFRS subsample	−8.12e−18	.00445	.05417
Ratio = sd(Pre-IFRS)/ sd(Post-IFRS)	$f = 1.2408$ $\Pr(F > f) = 0.1257$			

Notes: This table details the regression results of Equation (4). It compares the accrual quality of financial statements drawn up according to the UK GAAP and IFRS. Accrual quality is measured as the residuals from firm-specific regressions of changes in working capital on past, present and future operating cash flows. WCACC is the firm *j*'s working capital accruals in year *t*. CFO is firm *j*'s cash flow from operations in years *t*−1, *t* and *t*+1.
*Significance at the 10% level.
**Significance at the 5% level.
***Significance at the 1% level.

t. Both variables are scaled by total assets at the beginning of the year. The results of the earnings quality analysis are presented in Table 5.

As expected (Dechow and Dichev 2002), $WCACC_{j,t}$ is positively correlated with both past and future cash flows and negatively correlated with the current cash flows, for both the pre-

IFRS and post-IFRS subsamples. These results are found in both the Italian and UK samples. In addition, we also find a lower standard deviation of the residuals for the post-IFRS observations, indicating a higher quality of accruals; however, the difference is significant only for the Italian sample. Furthermore, for the Italian sample, the coefficient on future cash flow ($CFO_{j,t+1}$) is significant in the post-IFRS period, whereas in the pre-IFRS period it is not. These results support our interpretation of the increased emphasis given to interest cover in Table 4, that mandatory IFRS improved the quality of earnings of the Italian-listed companies. The results are also consistent with observations on Italian companies made by Andrei *et al.* (2005), Paglietti (2009) and Marra *et al*. (2011).

Hence we find that even in an institutional setting characterised by a weak level of investor protection and low enforcement mechanisms, mandatory IFRS adoption has exerted an important effect on the debt-contracting process. The higher transparency and quality of the IFRS compared with the Italian GAAP seem to have played a key role in improving the efficiency of the debt market. In particular, the implementation of the international accounting standards has dramatically reduced the managers' discretionality in the 'capitalisation or expensing' choices and, so doing, it has strengthened the reliability of earnings numbers (PWC 2008). The mandatory adoption of the IFRS has, therefore, increased the usefulness of the earnings data and the importance of financial reporting relative to privately held information, leading to a more objective and efficient way to estimate borrowers' credit ratings.

5. Concluding remarks and limitations

Mandatory adoption of IFRS has been required for all EU-listed companies since 1st January 2005 and a number of studies investigate whether there has been any consequent reduction in the cost of equity capital. A common finding is that IFRS has reduced the cost of capital only in countries with strong enforcement regimes.

In contrast, there is a paucity of research on the effects of IFRS on debt markets, even though financial disclosure by companies is important in defining the terms of the debt contract. Improved disclosure arising from the higher quality of IFRS accounting relative to domestic GAAP should play an important role in debt financing by allowing the terms of the contract to reflect economic fundamentals more efficiently. However, in countries with weaker incentives for transparency, the principles-based nature of the IFRS model may lead to the belief that companies are still behaving opportunistically, thus neutralising *de facto* the positive consequences theoretically associated with mandatory IFRS adoption.

This paper contributes to the literature in two main ways. First, we investigate the relation between the cost of debt and the introduction of the international accounting standards in two different institutional settings: in Italy, a typical code law with a weak outside investor protection system; and in the UK, a common-law country with GAAP comparable to IFRS and a strong legal protection of outside investors. This approach avoids the weakness of using indices to capture institutional country differences.

Second, the model we use is well suited to identify any effect of mandatory IFRS since it allows the effect to vary across companies. The model reflects the underlying objective of IFRS that users should be able to place more weight on the reported performance. Unlike other studies of the impact of mandated IFRS on the cost of capital, our approach does not assume that the reduction in the cost of debt is the same for all companies. It is not surprising that those studies have failed to find an IFRS effect in countries with relatively weak enforcement. It is precisely in this situation that the impact of mandated IFRS may vary between companies, some companies finding that the cost of debt is reduced, whereas others may find that their performance is less flattering than under local GAAP. Our model is designed to cover both outcomes.

We find that mandatory IFRS adoption has positively influenced the debt-contracting process in Italy. In particular, interest cover, which is an important measure of borrower risk, is a factor in the explanation of the cost of debt in the post-IFRS period but not in the pre-IFRS period. Our study adds to the relatively few investigations, such as Gaio and Raposo (2011), which find that credible disclosure is possible in a weak legal environment. In the UK, we find that there is no increased importance of accounting measures in the post-IFRS period. This is consistent with UK GAAP being relatively well enforced and roughly equivalent to IFRS.

This study is subject to a number of limitations. First, the cost of debt may be measured with error. This arises since our unit of observation is the company and not the debt issue. Although our measure of the cost of debt (interest expense divided by debt outstanding) is a common one in the literature, the interest expense in one year may reflect interest rates negotiated in prior years, although this possibility is lessened by the extent to which interest rates are renegotiated over time, and also by deleting all non-dichotomous variables at the tails of 5% and 95% (Francis *et al*. 2005, p. 310, Footnote 5) as in our study. However, any remaining measurement error would bias our study against the finding of an IFRS effect in the debt market. Second, another consequence of analysing companies rather than debt issues is that we cannot control for specific 'issue characteristics' such as the size of the issue and length to maturity. Thirdly, as in the vast majority of studies of IFRS impact, our conjecture about the impact of mandatory adoption is based on the changing coefficients of a cost of finance model. We provide no direct evidence that the more weight placed in the accounting numbers to assess the cost of debt is attributable to mandatory IFRS. We significantly lessen this criticism by showing that the quality of earnings of Italian companies improves in the IFRS period; but, of course, it is still possible that other factors, such as improved audit, were also at work. These issues should be considered by future work in the area which is in its infancy and yet should represent a major concern for regulators and standard setters.

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Notes

1. Francis *et al.* (2005) and Liu and Wysocki (2007) scale the standard deviation of NIBE by assets. We do not follow this procedure but instead take logs. There is no debt theoretic justification for scaling by assets; rather the purpose seems to be to reduce the effect of the outermost observations. However, since the standard deviation is likely to be small in relation to assets, the scaling procedure may, in fact, obscure any effect of the variation in NIBE on the cost of debt. Therefore, we use the log of the standard deviation of NIBE. When, for comparison with these studies, we scale by assets, the conclusions are unchanged and are available from the authors.
2. It is worthwhile to stress that it is possible to capture this aspect by using *ROA* and *Leverage* ratios. When *Leverage* is divided by *ROA*, it gives *debt/profit* which is the value of debt as a multiple of profit, reflecting the indebtedness of the firm in relation to its performance. However, we do not use this approach, since it reflects the capital aspects of debt rather than the more relevant income aspects captured by the *Interest Coverage* ratio. Of course the *Interest Coverage* ratio is negative when operating income is negative. We interpret this as meaning that the more negative the ratio, the less likely is the return to profit as suggested by Joos and Plesko (2005), thus increasing the company-specific risk.

3. The variable Log_NIBE, a measure of variability, is not thought to be influenced by the adoption of IFRS since it is measured over a rolling prior five-year period. Therefore, it is not given an interactive term.
4. This follows common practice, since the formal Kolmogorov–Smirnov and Shapiro–Wilk tests for normality are unreliable in large samples. Variables are likely to fail these tests even though the deviation from normality is insufficient to make any real difference (Kline 2005, p. 63).
5. This result does not necessarily imply that the cost of debt born by the Italian companies is lower than in the UK. Indeed, it is generally understood that the average price of basic banking services in Italy is amongst the highest in Europe (BBA 2006). However, this is largely due to the non-interest components of cost, such as advice and internet banking, that are not captured by our empirical analysis (Drummond *et al.* 2007).
6. In addition to the pairwise correlation analysis, a variance inflation factor (VIF) test has also been developed to control for multicollinearity. The VIF indices are always far below the critical value of 10, so permitting the assertion that multicollinearity is not a troublesome problem (Hair *et al.* 1995). For the sake of brevity, the results of the VIF test are not tabled, but they are available from the authors.
7. Sánchez-Ballesta and García-Meca (2011, Table 6) report R^2s of around 0.28, whilst Moir and Sudarsanam (2007, Table 5) and Liu and Wysocki (2007, Table 6) find much lower values of 0.06 and 0.005, respectively.
8. As with Table 2, the residuals show no signs of non-normality since the skewness and kurtosis values are below the value of 2 (see Garson 2012, Lomax and Hahs-Vaughn 2012).

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